512-MB ROMBot

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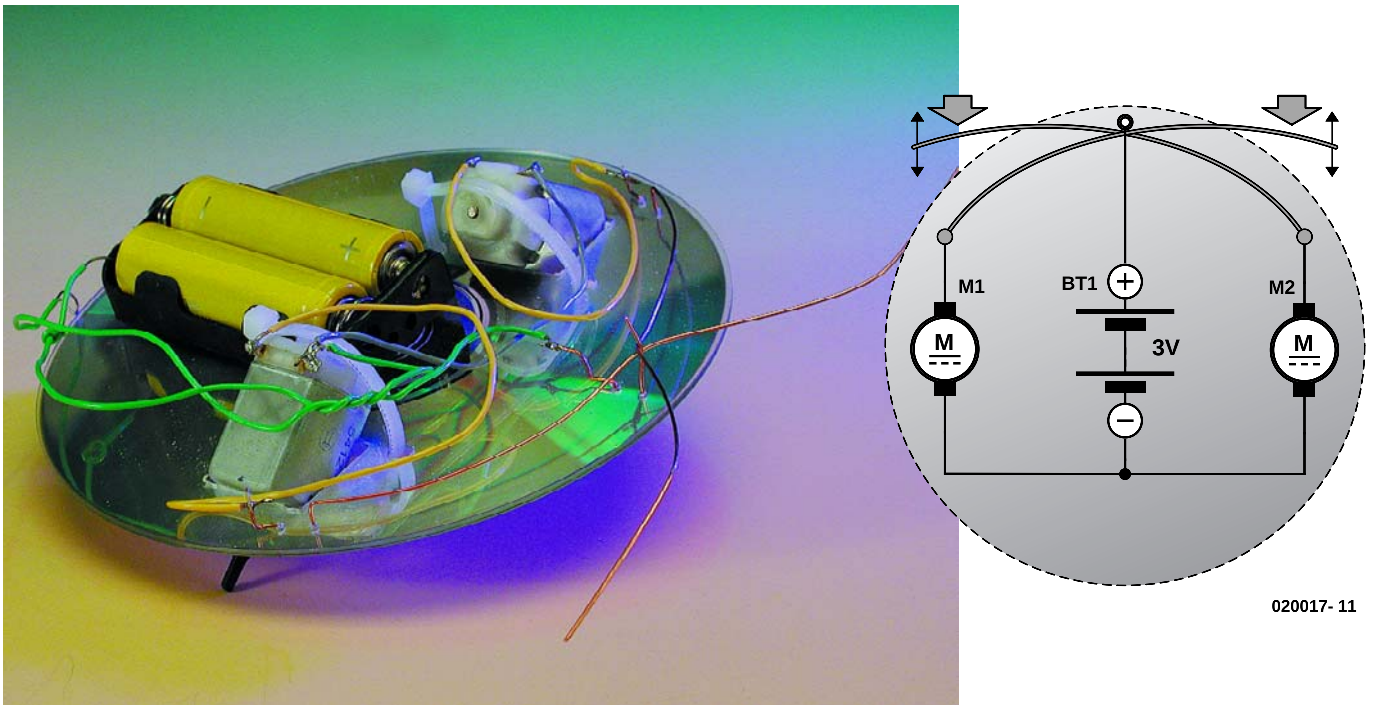

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What requirements should a modern robot satisfy? What do you expect from an advanced robot and its memory, operating system, browser version, sensors, supply, address and data bus width, propulsion method, construction and chassis material? These are all points that have to be considered carefully when designing a robot. This doesn't appear to be a simple task.

If we make a list of actions that our robot should perform for it to survive in this hostile world, the most important is that it should be able to avoid any obstacles in its path. It should detect all objects that are in its way and then adjust its behaviour in order to move round them. A bit of thought led to the conclusion that this could be achieved with two motors for the propulsion. **Table 1** shows the truth table for the workings of this robot.

We can draw the following conclusions from the truth table. The first is that the robot presented here is 100% digital, because it works solely with ones and zeros. The second is that it is a two-bit machine. That may sound simplistic, but the most modern 64-bit Pentium-IV machine works along the same underlying principle. As far as the operating system is concerned, these days you would expect at least Windows 98. ME and XP should work pretty well too. IE5 is a minimum requirement, with Netscape a good second choice. It would need a lot of memory for it to react well to its surroundings; 512 MB seems to be an amount that would add some 'real' intelligence to the system. For the chassis we'll use plain but very strong materials. Here as well we see the trend towards light, strong composite materials, including plastic and aluminium. All modern Pentium processors nowadays run at 3.3 V; we'll go one step further and use 3 V.

We turn on our robot and let it loose in the big bad world. It moves around objects and satisfies all other requirements mentioned above. Where else can you find this for under a fiver nowadays? Two diagonally mounted motors on a CD chassis, two AA cells and two push-to-break switches made from copper wire – and it works too!

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Table I. Truth Table

Lefthand sensor active?		Right-hand sensor active?		Response	Left-hand motor		Right-hand motor	
no	0	no	0	straight on	on	1	on	1
no	0	yes	1	turn left	off	0	on	1
yes	1	no	0	turn right	on	1	off	0
yes	1	yes	1	stop	off	0	off	0